FIRE RESISTANT CONSTRUCTION

Background of the Invention

(1) Field of the Invention

The present invention relates generally to a structure having a fire resistance rated, area separation wall and, more particularly, to a two-hour fire resistance rated, area separation wall for a structure including an interior support structure; only an outer membrane on each side of said interior support structure; and a substantially organic thermal insulation barrier between the outer membranes.

(2) Description of the Prior Art

Multi-family residential constructions typically include a separation wall constructed of wood members and having an insulating material between the units. These wood members may include dual two-by-four framing with a drywall surface on both sides of the framing. In most cases, this type of construction requires that the drywall be attached to the interior surface of the framing before the framing is placed upright to serve as a wall. After the framing is placed upright, insulation material may be positioned in the framing, and later an additional drywall membrane is fastened to the outside of the framing to complete an interior wall. This process is expensive, labor-intensive and time consuming.

One purpose of such a dual membrane construction of an area separation wall is to provide a fire resistance separation between adjacent spaces to meet federal, state and local regulations concerning the fire resistance of such a construction. Underwriters Laboratories Inc. (UL), an independent, not-for-profit product safety testing and certification organization, has been testing products for public safety for more than a century. Because UL has an undisputed reputation as the leader in U.S. product safety and certification, it is advantageous to obtain classification of a building product by UL. One UL test, ANSI/UL 263 (ASTM E119 and NFPA 251), involves rating such a separation wall for fire resistance. If a separation wall including only an outer membrane could be developed that is sufficiently fire resistant

to gain UL classification for two-hour fire resistance, such a separation wall would be less costly to construct than conventional separation wall.

Thus, there is a need for a structure having a fire resistance rated, area separation wall, the structure including a first and second building units and a two-hour fire resistance rated, area separation wall having only outer membranes.

Summary of the Invention

The present invention is directed to a structure having a fire resistance rated, area separation wall including: a first building unit; a second building unit; and a two-hour fire resistance rated, area separation wall having only outer membranes. In the preferred embodiment, the two-hour fire resistance rated, area separation wall includes: (a) an interior support structure; (b) only an outer membrane on each side of the interior support structure; and (c) a substantially organic thermal insulation barrier between the outer membranes. Also, in the preferred embodiment, the structure having a fire resistance rated, area separation wall may include a tying structure connecting the fire resistance rated, area separation wall to the first unit and the second unit.

Accordingly, one aspect of the present invention is to provide a structure having a fire resistance rated, area separation wall including: a first building unit; a second building unit; and a two-hour fire resistance rated, area separation wall having only outer membranes.

Another aspect of the present invention is to provide a two-hour fire resistance rated, area separation wall for a structure including: an interior support structure; only an outer membrane on each side of the interior support structure; and a substantially organic thermal insulation barrier between the outer membranes.

Still another aspect of the present invention is to provide a structure having a fire resistance rated, area separation wall, the structure including: a first building unit; a second building unit; and a two-hour fire resistance rated, area separation wall having only outer membranes, The area separation wall including: (a) an interior support structure; (b) only an outer membrane on each side of the interior support structure; and (c) a substantially organic thermal insulation barrier between the outer

membranes; and a tying structure connecting the fire resistance rated, area separation wall to the first unit and the second unit.

These and other aspects of the present invention will become apparent to those skilled in the art after a reading of the following description of the preferred embodiment when considered with the drawings.

Brief Description of the Drawings

Figure 1 is a front perspective view of a structure having a fire resistance rated, area separation wall constructed according to the present invention;

Figure 2 is a side view of the two-hour fire resistance rated, area separation wall for a structure shown in Figure 1 including a tying structure; and .

Figure 3 is a side view of the two-hour fire resistance rated, area separation wall for a structure shown in Figure 1 without a tying structure

Description of the Preferred Embodiments

In the following description, like reference characters designate like or corresponding parts throughout the several views. Also in the following description, it is to be understood that such terms as "forward," "rearward," "left," "right," "upwardly," "downwardly," and the like are words of convenience and are not to be construed as limiting terms.

Referring now to the drawings in general and Figure 1 in particular, it will be understood that the illustrations are for the purpose of describing a preferred embodiment of the invention and are not intended to limit the invention thereto. As best seen in Figure 1, a structure having a fire resistance rated, area separation wall, generally designated 10, is shown constructed according to the present invention. The structure having a fire resistance rated, area separation wall includes a first building unit 12 and a second building unit 14. Additional building units 16 may also be part of the structure 10. The first building unit 12 and second building units 14 may be occupiable spaces, which may be residentially occupiable spaces, such as town homes. A town house is generally defined by the 2000 International Residential Code as a single-family dwelling unit constructed as a group of three or more attached units

in which each unit extends from foundation to roof with open space on at least two sides. A two-hour fire resistance rated, area separation wall 18, constructed according to the present invention, is located between each building unit 12, 14, 16.

Figure 2 is a side view of one embodiment of the two-hour fire resistance rated, area separation wall 18 including an interior support structure 22 having only an outer membrane 24 on each side of the interior support structure 22, and a substantially organic thermal insulation barrier 26 between the outer membranes 24. The interior support structure 22 includes at least two structurally independent interior support members 28. The structurally independent interior support members 28 include a plurality of vertical members such as conventional 2x4 . The plurality of vertical members may be spaced apart no more than about 16 inches and include cross bracing 30 at about their mid height. The two-hour fire resistance rated, area separation wall 18 includes a physical gap 32 between the structurally independent interior support members 28. A tying structure 34 connects the first unit 12 and the second unit 14. The tying structure 34 may be a conventional 2x8. The tying structure is overlaid top plates 37 that is attached to the top edge of the interior support members 28. A bottom plate 36 is attached to the bottom edge of the interior support members 28. Also, the maximum height of the fire resistance rated area separation wall preferably is 10 feet, whereupon another wall would begin.

The outer membranes 24 preferably are a fire resistant wallboard, including Type X and Type C gypsum wallboard (GWB) as defined in ASTM C11. The gypsum wallboard preferably conforms to ASTM Test C-36-96. The substantially organic thermal insulation barrier 26 between the outer membranes 24 may be selected from the group consisting of fibrous material, granular material, pellet material, aggregated material, agglomerated material and mixtures thereof. The substantially organic thermal insulation barrier 26 may be a natural material. The natural material may be cellulosic. The substantially organic thermal insulation barrier 26 may be an acoustically non-conductive material.

Figure 3 is a side view of the preferred embodiment of the two-hour fire resistance rated, area separation wall 18 that does not include a tying structure 34 connecting the first unit 12 and the second unit 14. Instead, the two-hour fire

resistance rated, area separation wall 18 described in Figure 3 includes a separate top plate 37 attached to another top plate 37 that is attached to the top edge of the interior support members 28. In both embodiments, a bottom plate 36 is attached to the bottom edge of the interior support members 28. Also, in both embodiments, the maximum height of the fire resistance rated area separation wall preferably is 10 feet, whereupon another wall would begin.

As can be seen, the top of the area separation wall can be formed either by a top plate 37 overlaid with a tying structure 34 or by a top plate 37 overlaid with a second top plate 37 separated by an inch. Thus, there are two configurations. One is with a single top plate 37 and a tying structure 34 that joins the two walls (shown in Fig. 2) and the other is two separate top plates with a space between them (shown in Fig. 3). In either case, this results in a double top plate being formed.

Certain modifications and improvements will occur to those skilled in the art upon reading of the foregoing description. It should be understood that all such modifications and improvements have been deleted herein for the sake of conciseness and readability but are properly within the scope of the following claims.